
चिकित्सा के उपयोग में आने वाले गैस सिलेंडरों
और संबंधित उपकरणों का रंग पहचान

(पहला पुनरीक्षण)

**Colour Identification of Gas
Cylinders and Related Equipment
Intended for Medical Use**

(*First Revision*)

ICS 01.070; 23.020.35

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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Gas Cylinders Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

This standard was first published in 1966. In this revision the following major changes have been made:

- a) Colour identification of medical gas cylinders made from aluminium; and
- b) UN no/RAL no has been prescribed against each gas as alternate to colour shade no.

In the preparation of this standard assistance has been derived from the ISO 32 : 1977 'Gas cylinders for medical use — Marking for identification. Gas cylinder rules — 2016.

Gases of different chemical composition and in various combinations are widely used in the medical profession for the production of anaesthesia and for the treatment of certain pathological conditions. To ensure the administration of these gases in a safe and a satisfactory manner it is essential that proper identification practice is followed. This standard deals with the code of identification of medical gas cylinders based on various colour combinations for different gases.

Identification of the contents of industrial gas cylinders has been covered in IS 4379 : 1981 'Identification of the contents of industrial gas cylinders'.

It has been usual to specify the contents of gas cylinders by colour marking of the gas cylinders. With the increasing number of gases and mixture of gases used by industry, the number of discreet colours for identifying the gases concerned is not sufficient. Therefore, it has become customary to identify the contents of the gas cylinders by marking the cylinders with the name of the gas and chemical formula in addition to colour marking of the cylinders and a separate standard for colour coding for medical gas cylinders.

The composition of the Committee responsible for the formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

COLOUR IDENTIFICATION OF GAS CYLINDERS AND RELATED EQUIPMENT INTENDED FOR MEDICAL USE

(*First Revision*)

1 SCOPE

This standard applies to the identification of the contents of the gas cylinders intended for medical use.

2 REFERENCES

The standard listed below are necessary adjuncts to this standard. At the time of publication, the edition indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

IS No.

Title

5 : 2007 Colours for ready mixed paints and enamels (*sixth revision*)

3 IDENTIFICATION MARKING

3.1 Cylinders shall be legibly and permanently marked, preferably at the valve end of the cylinder and shall extend down the cylinder to the shoulder.

3.2 The chemical formulae and name of the gas it contains and UN Number (if available) shall also be marked in accordance with Table 1 (other than Aluminium cylinders).

3.3 The chemical formulae and the name of the gas it contains and UN Number (if available), shall also be marked in accordance with Table 2 (Aluminium cylinder).

3.4 The marking shall not be made on the body of the cylinder but shall be at areas in the formed neck where the thickness of metal is greater than the design minimum and where it is adequate for marking to be carried. The manufacturer's identification, however, may be marked on the base.

3.5 Suitable areas for marking shall be determined by sectioning a prototype cylinder by any suitable method acceptable to the statutory authority.

3.6 The characters in marking shall normally be at least 6 mm in height. On cylinders below 140 mm diameter this height may be reduced, but in no case shall the characters be less than 3 mm in height. The indication shall not be of excessive depth.

3.7 The stamps used for marking shall have small radii at changes of section to avoid the formation of sharp edges in the stamped marking.

3.8 The colour of lettering and figures shall contrast against the ground colour of the cylinder and shall be such as not to impair the legibility.

4 COLOUR IDENTIFICATION

4.1 All medical gas cylinders shall be painted externally in accordance with Table 1 to provide means for visual identification of the gaseous contents (other than Aluminium cylinders).

4.2 Aluminium cylinder containing gas and gas mixture for medical use with a specified identification shall be colour marked in accordance with Table 2.

5 PIPELINES AND TUBING

The pipelines for distribution of medical gases in hospitals and visible connecting tubing of anaesthetic apparatus shall be marked with bands at each end and at every joint by the colour appropriate for the gases, as shown in Table 1. The first colour band shall correspond to the appropriate colour under valve end colour and the second colour band to the appropriate colour under body colour as indicated in Table 1.

Table 1 Identification Marking of Medical Gas Cylinders with Chemical Formulae, UN Number and Colour Code (Other than Aluminium Cylinders)

(Clauses 3.2, 4.1 and 5)

Sl No.	Name of Gas	UN Number	Chemical Symbol	Ground Colour	Colour Shade No./RAL No.	Colour of Shoulder	Colour Shade No./RAL No.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Air	1002	—	French grey, (shade 630)	C.S. 630	*White and black	RAL 9003 RAL 9011
ii)	Carbon dioxide	1013	CO ₂	French grey, (shade 630)	C.S. 630	French grey, (shade 630)	C.S. No. 630
iii)	Cyclopropane	1027	C ₃ H ₆	Light orange (shade 557)	C.S. 557	Light orange (shade 557)	C.S. 557
iv)	Ethylene	1962	C ₂ H ₄	Dark violet (shade 796)	C.S. 796	Dark violet (shade 796)	C.S. 796
v)	Helium	1046	He	Middle brown (shade 411)	C.S. 411	Middle brown (shade 411)	C.S. 411
vi)	Mixture of oxygen and carbon dioxide	—	O ₂ +CO ₂	Graphite black	RAL 9011	*White and french grey	RAL 9003 C.S. 630
vii)	Mixture of oxygen and helium	—	O ₂ +He	Graphite black	RAL 9011	*White and brown (middle brown, shade 411)	RAL 9003 C.S. 411
viii)	Nitrogen	1066	N ₂	French grey, (shade 630)	C.S. 630	Graphite black	RAL 9011
ix)	Nitrous oxide	1070	N ₂ O	French blue, (shade 166)	C.S. 166	French blue, (shade 166)	C.S. 166
x)	Oxygen	1072	O ₂	Graphite black	RAL 9011	White	RAL 9003

NOTES

1 Colour shades have been taken from either of the two standards – I) CS (Colour shade) designated from IS 5 and II) RAL: from RAL colour Standard.

2* To be painted in quarters around the shoulder where two colours are used for identification. Please see Plan of the shoulder. See Annex A.

**Table 2 Colour Identification of Medical Gas Cylinders Made From Aluminium**

(Clauses 3.3 and 4.2)

Sl No.	Name of Gas	UN Number	Ground Colour	RAL No.	Colour of Shoulder	Colour Shade No./RAL No.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	*Air	1002	Aluminium finish	9006	White and graphite black*	RAL 9003 RAL 9011
ii)	Cyclopropane	1027	Aluminium finish	9006	Orange	C.S. 557
iii)	Carbon dioxide	1013	Aluminium finish	9006	Grey	C.S. 630
iv)	Ethylene	1962	Aluminium finish	9006	Violet	C.S. 796
v)	Helium	1046	Aluminium finish	9006	Brown	C.S. 411
vi)	*Mixture of oxygen and carbon dioxide		Aluminium finish	9006	White and grey*	RAL 9003 C.S. 630
vii)	*Mixture of oxygen and helium		Aluminium finish	9006	White and brown*	RAL 9003 C.S. 411

Table 2 (Concluded)

Sl No.	Name of Gas	UN Number	Ground Colour	RAL No.	Colour of Shoulder	Colour Shade No./RAL No.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
viii)	Nitrous oxide	1070	Aluminium finish	9006	Blue	C.S. 166
ix)	Nitrogen	1066	Aluminium finish	9006	Graphite black	RAL 9011
x)	Oxygen	1072	Aluminium finish	9006	White	9003

NOTES

1 Colour shades have been taken from either of the two Standards:

- a) Colour shade (CS) designated from IS 5 : 2007; and
- b) RAL, from RAL colour Standard.

2* To be painted in quarters around the shoulder where two colours are used for identification. Please see plan of the shoulder. *See Annex B.*

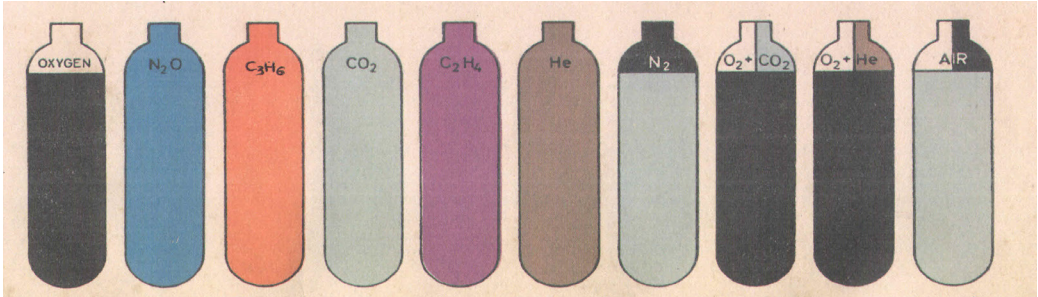
3 *See Annex C for RAL colour code and corresponding shade.*



ANNEX A

(Clause Table 1)

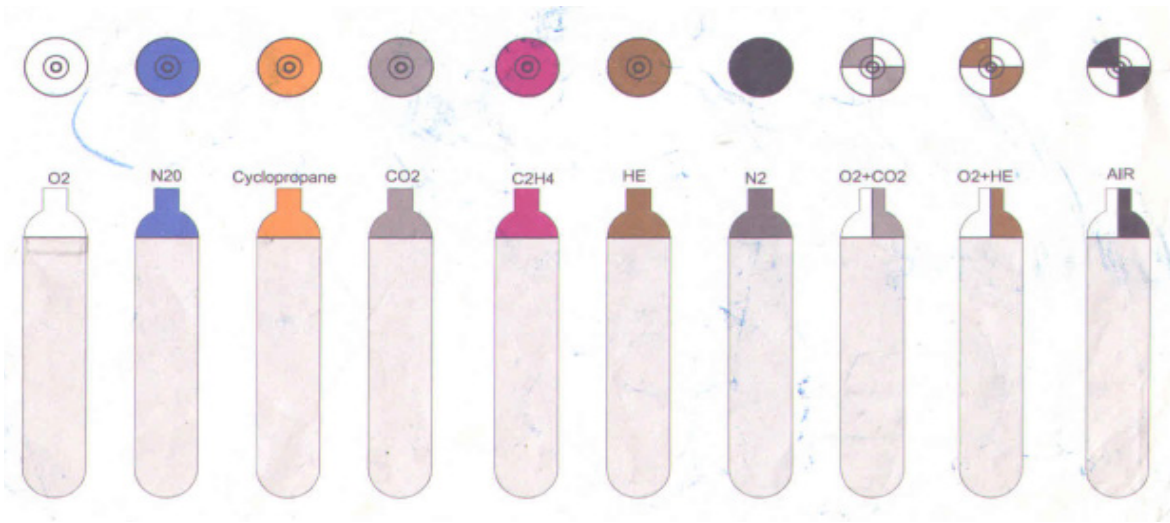
COLOUR IDENTIFICATION OF MEDICAL GAS CYLINDERS
(OTHER THAN ALUMINIUM CYLINDERS)



ANNEX B

(Clause Table 2)

COLOUR IDENTIFICATION OF MEDICAL ALUMINIUM ALLOY GAS CYLINDERS






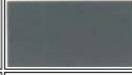





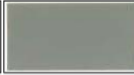
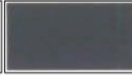
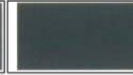



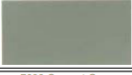

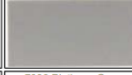




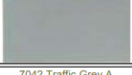
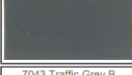
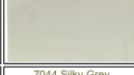
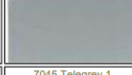
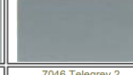
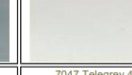


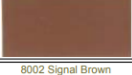
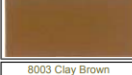

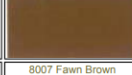

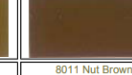




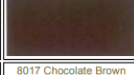
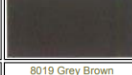
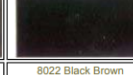
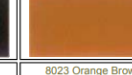


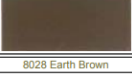
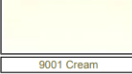




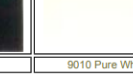


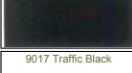

ANNEX C

(Clause Table 2)

RAL COLOR CODE AND CORRESPONDING SHADE

1000 Green Beige	1001 Pale Beige	1002 Sand Yellow	1003 Signal Yellow	1004 Dark Golden Yellow	1005 Honey Yellow	1006 Maize Yellow	1007 Chrome Yellow
1011 Brown Beige	1012 Lemon Yellow	1013 Pearl White	1014 Dark Ivory	1015 Light Ivory	1016 Sulphur Yellow	1017 Saffron Yellow	1018 Zinc Yellow
1019 Grey Beige	1020 Olive Yellow	1021 Cadmium Yellow	1023 Traffic Yellow	1024 Ochre Yellow	1027 Curry Yellow	1028 Mellon Yellow	1032 Broom Yellow
1033 Dahlia Yellow	1034 Pastel Yellow	2000 Yellow Orange	2001 Red Orange	2002 Vermillion	2003 Pastel Orange	2004 Pure Orange	2008 Light Red Orange
2009 Traffic Orange	2010 Signal Orange	2011 Deep Orange	2012 Salmon Orange	3000 Flame Red	3001 RAL Signal Red	3002 Carmine Red	3003 Ruby Red
3004 Purple Red	3005 Wine Red	3007 Black Red	3009 Oxide Red	3011 Brown Red	3012 Beige Red	3013 Tomato Red	3014 Antique Pink
3015 Light Pink	3016 Coral Red	3017 Rose	3018 Strawberry Red	3020 Traffic Red	3022 Dark Salmon Red	3027 Raspberry Red	3031 Orient Red
4001 Red Lilac	4002 Red Violet	4003 Heather Violet	4004 Claret Violet	4005 Blue Lilac	4006 Traffic Purple	4007 Purple Violet	4008 Signal Violet
4009 Pastel Violet	4010 Telemagenta	5000 Violet Blue	5001 Green Blue	5002 Ultramarine Blue	5003 dark Sapphire Blue	5004 Black Blue	5005 Signal Blue
5007 Brilliant Blue	5008 Grey Blue	5009 Light Azure Blue	5010 Gentian Blue	5011 Steel Blue	5012 Light Blue	5013 Dark Cobalt Blue	5014 Pigeon Blue
5015 Middle Sky Blue	5017 Traffic Blue	5018 Turkish Blue	5019 Capri Blue	5020 Ocean Blue	5021 Water Blue	5022 Night Blue	5023 Fern Blue
5024 Pastel Blue	6000 Patina Green	6001 Middle Emerald Green	6002 Leaf Green	6003 Middle Olive Green	6004 Blue Green	6005 Light Moss Green	6006 Grey Olive
6007 Bottle Green	6008 Brown Green	6009 Fir Green	6010 Middle Grass Green	6011 Reseda Green	6012 Black Green	6013 Reed Green	6014 Yellow Olive
6015 Black Olive	6016 Turquoise Green	6017 May Green	6018 Yellow Green	6019 Pastel Green	6020 Chrome Green	6021 Pale Green	6022 Brown Olive
6024 Traffic Green	6025 Bracken Green	6026 Opal Green	6027 Turkish Green	6028 Pine Tree Green	6029 Mint Green	6032 Signal Green	6033 Turquoise Blue
6034 Pale Turquoise	7000 Dark Squirrel Grey	7001 Silver Grey	7002 Olive Grey	7003 Moss Grey	7004 Signal Grey	7005 Mouse Grey	7006 Beige Grey

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7008 Khaki Grey	7009 Green Grey	7010 Tarpaulin Grey	7011 Iron Grey	7012 Basalt Grey	7013 Brown Grey	7015 Slate Grey	7016 Anthracite Grey
							
7021 Black Grey	7022 Umber Grey	7023 Concrete Grey	7024 Graphite Grey	7026 Granite Grey	7030 Stone Grey	7031 Blue Grey	7032 Grey
							
7033 Cement Grey	7034 Yellow Grey	7035 Pale Grey	7036 Platinum Grey	7037 Dusty Grey	7038 Agate Grey	7039 Quartz Grey	7040 Window Grey
							
7042 Traffic Grey A	7043 Traffic Grey B	7044 Silky Grey	7045 Telegrey 1	7046 Telegrey 2	7047 Telegrey 4	8000 Green Brown	8001 Gold Brown
							
8002 Signal Brown	8003 Clay Brown	8004 Copper Brown	8007 Fawn Brown	8008 Olive Brown	8011 Nut Brown	8012 Red Brown	8014 Sepia Brown
							
8015 Chestnut Brown	8016 Mahogany Brown	8017 Chocolate Brown	8019 Grey Brown	8022 Black Brown	8023 Orange Brown	8024 Beige Brown	8025 Pale Brown
							
8028 Earth Brown	9001 Cream	9002 Grey White	9003 Signal White	9004 Signal Black	9005 Jet Black	9010 Pure White	9011 Graphite Black
							
9016 Traffic White	9017 Traffic Black	9018 Papyrus White					

ANNEX D*(Foreword)***COMMITTEE COMPOSITION**

Gas Cylinder Sectional Committee, MED 16

<i>Organization</i>	<i>Representative(s)</i>
Petroleum and Explosive Safety Organization, Nagpur	SHRI M. K. JHALA (Chairman) SHRI V. K. MISHRA (<i>Alternate I</i>) SHRI JAMUNALAL ROUT (<i>Alternate II</i>)
All India Industrial Gases Manufacturers Association, New Delhi	SHRI SAKET TIKU SHRI K. R. SAHASRANAM (<i>Alternate</i>)
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Bhiwadi Cylinders Pvt Ltd, New Delhi	SHRI SUNIL K. DEY
Directorate General of Quality Assurance, Ministry of Defence, New Delhi	COL R. DHANKHAR
Everest Kanto Cylinder Ltd, Mumbai	SHRI GHANSHYAM GOYAL SHRI A. K. KHAMKAR (<i>Alternate I</i>) SHRI A. S. V. S PRASAD (<i>Alternate II</i>)
Gujarat Gas Ltd, Surat	SHRI RAVI RAVIPALLI
Hindustan Petroleum Corporation Ltd, Kolkata/Mumbai	SHRI DEBASHISH CHAKRAVERTY SHRI PRAVIN MANOHAR HADKE (<i>Alternate</i>) SHRI MANIKANDAN M. (<i>Young Professional</i>)
Ideal Engineers Hyderabad Private limited, Hyderabad	SHRI SATISH KABRA SHRI S. GOPALAIAH (<i>Alternate</i>)
Indian Oil Corporation Ltd, Mumbai	SHRI SHANKAR SHARAN SHRI SANJAY GUPTA (<i>Alternate</i>)
Indraprastha Gas Limited, Delhi	SHRI UJWAL BHANDARI SHRI SUSHIL KUMAR (<i>Alternate</i>) SHRI AVIRAL RAJEEV (<i>Young Professional</i>)
International Industrial Gases Ltd, Howrah	SHRI DEVENDRA K. GARG SHRI NIKHILESH K. GARG (<i>Alternate</i>)
INOX India Limited, Vadodara	SHRI DEEPAK V. PATWARDHAN SHRI DEEPAK V. ACHARYA (<i>Alternate</i>)
Kosan Industries Ltd, Mumbai/Surat	SHRI GIRISHBHAI K. DESAI SHRI S. B. BOLMAL (<i>Alternate</i>)
LPG Equipment Research Centre, Benagluru	SHRI NARESH GERA SHRI A. K. BERA (<i>Alternate</i>)
LINDE India Ltd, Kolkata	SHRI RAMANA VUTUKURU SHRI PARDEEP (<i>Alternate</i>) SHRI P. R. DEODHAR (<i>Young Professional</i>)

<i>Organization</i>	<i>Representative(s)</i>
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Research and Development Establishment, Pune	DR SHANKAR BHAUMIK SHRI TAMHANKAR RAVINDRA (<i>Alternate</i>)
Sakha Engineers Private Limited, New Delhi	SHRI AMARJIT S. KOHLI
Society of Indian Automobile Manufacturers, New Delhi	SHRI K. K. GANDHI SHRI AMIT KUMAR (<i>Alternate</i>)
Steel Authority of India Limited (SAIL), Research and Development Centre for Iron and Steel, Ranchi	SHRI S. K. MOHAPATRA SHRI SANTOSH KUMAR (<i>Alternate</i>)
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Vanaz Engineers Pvt Ltd, Pune	SHRI S. J. VISPUTE SHRI ANIL S. LATKE (<i>Alternate</i>)
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Member Secretary
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This Indian Standard has been developed from Doc No.: MED 16 (14963).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi